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acquaintance with the general phenomena; it is admitted that local elevations occurred, and some of the widely isolated points thus elevated are enumerated, and other explanations of the phenomena are passed under review, but dismissed as either insufficient or actually confirmatory of Darwin's theory. The soundings of Mr. Murray off northern Tahita, showing the rapid increase of depth beyond the forty fathom line until, at a mile from the shore, the slope of the ocean bottom was nearly that of the land, are shown to be exactly in accordance with the subsidence theory. The strongest evidence, derived from the writings of A. Agassiz and the soundings of the *Blake*, points to a great subsidence in the Florida region during the coral reef era, and the elongation of the coral reefs and formation of inner channels now going on by drifting coral sands is shown to be but a part of the sand-beach forming process which is in operation along the entire Atlantic coast of North America, from Long Island southward, and to in no way vitiate the evidence in favor of previous subsidence. The abrasion-solution theory of Semper seems to be negatived by the absence of open channels in the lagoons of the smaller atolls, moreover, instead of small lagoons having the purest waters, it is they which are most choked by coral sands.——Almost perfect skeletons of *Rhytina gigas* have been recently mounted in the National Museum, Washington, and in the British Museum.

MINERALOGY AND PETROGRAPHY.[1]

NEW MINERALS.—*Gerhardite.*— Messrs. Wells and Penfield[2] have described natural crystals of a basic copper nitrate which was first identified by Professor Brush, of New Haven, on specimens of copper ore from the United Verde mines, Jerome, Arizona. The crystals, which belong to the orthorhombic system, are mainly made up of a large series of pyramids and the basal pinacoid. Twelve forms were observed. Color dark green; hardness 2; specific gravity 3.426. Plane of the optic axes is the brachypinacoid; double refraction very strong, negative; pleochroism distinct.

An analysis gave:

H_2O	CuO	N_2O_5
11.26	66.38	22.25

Named after the chemist who first determined the composition of the same compound made artificially. This is the only insoluble nitrate known in nature.

Hanksite.—This name was suggested in May of the present year, by Mr. W. E. Hidden,[3] for an anhydrous sulphato-carbonate of sodium occurring in San Bernardino county, Cal. This mineral was exhibited at the New Orleans exposition as thenardite, but was proven by both a crystallographic and optical examination to crystallize in the hexagonal instead of the orthorhombic system. Chemical analysis by Messrs. Mackintosh and Penfield[1] indicate for the formula of this mineral: $4\ (Na_2SO_4) + Na_2CO_3$, with some admixture of potassium and sodium chlorides. The name was assigned in honor of Professor Henry G. Hanks, State mineralogist of California.

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[1] Edited by Dr. GEO. H. WILLIAMS, of the Johns Hopkins University, Baltimore.

[2] *American Journal of Science*, July, 1885, p. 50.

[3] Ib., Aug., 1885, p. 133.

Elpasolite is proposed by Messrs. Cross and Hillebrand[2] for a variety of cryolite in which about two-thirds of the sodium is replaced by potassium. Their analysis gives:

Al	Ca	Mg	K	Na	F	Total
11.32	0.72	0.22	28.93	9.90	46.98	98.08

It was found in small cavities in the massive pachnolite occurring with other minerals of the cryolite group at El Paso county, Colorado.

AMERICAN MINERALS.—The last published bulletin of the U. S. Geology Survey (No. 20) entitled "Contributions to the Mineralogy of the Rocky mountains," by Messrs. C. W. Cross and W. F. Hillebrand, contains much valuable information regarding Colorado minerals. A large portion of the matter has already appeared in the pages of the *American Journal of Science* and of the proceedings of the Colorado Scientific Society, but the republication of these papers with many corrections and additions is very welcome. The first chapter deals with the zeolites which occur in the basalt of Table mountain, near Golden, Colorado. The following species were observed, the order of crystallization being: (1) laumontite (oldest); (2) stilbite; (3) thomsonite; (4) calcite (yellow); (5) stilbite; (6) chabazite; (7) thomsonite; (8) analcite; (9) apophyllite; (10) calcite (colorless); (11) mesolite. Natrolite, scolecite and levynite were also found; but not in associations which warranted certain conclusions regarding their relative ages. The analcite and apophyllite exhibited optical anomalies similar to those observed in these minerals from other localities. Chapter second deals with the minerals occurring near Pike's Peak. These occur in veins and druses of a coarse red granite supposed to be of archæan age. The most interesting of these minerals are members of the cryolite group, of which seven species were identified, viz: (1) cryolite upon which by a study of the lamellæ five different twinning laws were found, *i. e.*, twinning plane ∞P; $\frac{1}{2} P$ (r) $\infty P \bar{\infty}$, $\frac{1}{2}P$ (l) and—$\frac{1}{2}P$ (l); (2) pachnolite; (3) thomsenolite; (4) ralstonite (?); (5) gearksutite to which Flight's "Evigtokite" (vid., NATURALIST, 1885, p. 708) is reckoned; (6) Elpasoite (no. sp.); (7) proposite. Phenacite, zircon, topaz, cassiterite, fluorite and several other species also occur in the granite of Pike's Peak, in addition to the common microcline and smoky quartz. Minor investigations on the luster of sanidine in certain rhyolites; on the occurrence of topaz in nevadite; short notes on many observed minerals, including the two new species zunyite and guitermanite, already mentioned in the NATURALIST'S notes, make up the other chapters.

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[1] *American Journal of Science*, Aug., 1885, p. 137.

[2] Bulletin U. S. Geol. Surv., No. 20, p. 57.

Bulletin No. 12 of the U. S. Geological Survey contains a very interesting study, by Professor E. S. Dana, of "thinolite," a name applied by Mr. Clarence King to an enigmatical calcite pseudomorph which occurs abundantly in the old lake basins of the far West. This mineral was at first considered a pseudomorph after gaylussite; Professor Dana, however, shows that this cannot be the case as the original form was clearly tetragonal. What the chemical composition of the original mineral was, it is impossible to state with certainty, but judging from the analogy of well-known lead-carbonate pseudomorphs after phosgenite ($PbCO_3 + PbCl_2$), the author thinks it quite probable that the original form may have been a similar double salt with the composition $CaCO_3 + NaCl^1$ or $CaCO_3 + 2NaCl$.

M. S. L. Penfield[1] has described crystals of the rare selenide of mercury, tiemanite, from Marysvale, in southern Utah. They are tetrahedral and closely resemble crystals of sphalerite. Observed forms are $\infty O \infty$ (a); $+\frac{O}{2}$ (o); $-\frac{O}{2}$ (ó); $+\frac{5O5}{2}$ (w) and $+\frac{\frac{7}{3}O\frac{7}{3}}{2}$ (φ) — other indistinct positive hemi-trisoctahedra appear on some crystals as striations. The crystals measure less than 3^{mm} in diameter. They are of a black color with a high metallic luster. Twins parallel to the octahedral face are very common.

The same writer[2] also describes crystals of the allied black sulphide of mercury, metacinnabarite, which has heretofore been generally regarded as amorphous. They come from the Reddington mine, Lake Co., California, and measure as much as 4^{mm} in diameter. This mineral is in all respects isomorphous with tiemanite. Observed forms are $\pm\frac{O}{2}$; $\pm\frac{\frac{3}{2}O\frac{3}{2}}{2}$, $\pm\frac{2O2}{2}$ and $\frac{\frac{9}{5}O\frac{9}{7}}{2}$ (?).

The intermediate compound, onofrite, Hg (S, Se), is not yet known in distinct crystals, but is doubtless isomorphous with the two minerals mentioned above.

Mr. Penfield[3] has likewise described and figured some interesting analcite crystals from the Phœnix mine in the Lake Superior copper region. They show the usual trisoctahedron, 2O2, with each edge replaced by a reëntrant angle. A microscopic examination of thin sections of these crystals shows that they are divided into four secants with a faint irregular action on polarized light. Very many crystals show a perfect but small trisoctahedron in their center, around which the exterior portion appears to be a secondary growth.

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[1] American Journal of Science, June 1885, p. 449.

[2] Ib. p. 452.

[3] Ib., Aug., 1885, p. 112.

Mr. J. P. Iddings[1] of the U. S. Geological Survey communicates a very interesting account of minute fayalite crystals which occur in the lithophyses of the obsidian and rhyolite in the Yellowstone Park. They are less than 2^{mm} in length, black in color and tabular in habit. The following forms were determined by Mr. Penfield: $\infty P\bar{\infty}$, $\infty P\breve{\infty}$, $\infty P\breve{2}$, P, $P\bar{\infty}$ and $2P\breve{\infty}$. An analysis by Dr. Gooch gave:

SiO	FeO	MgO
32.41	65.49	2.10

Fayalite has heretofore been known only on artificial slags to which the obsidians of the Yellowstone have a close resemblance.

Messrs. Cross and Iddings[2] describe the wide-spread distribution of the mineral allanite as a rock constituent. The chemical nature of this mineral was determined by an analysis by Hillebrand of material isolated from a biotite porphyrite of the Ten Mile District, Colorado. Crystals of an exactly similar nature were discovered in thin sections of all the more acid varieties of massive rocks from many widely separated localities.

Mr. W. G. Brown[3] gives an account of a quartz-twin found in the soil of Albermarle Co., Va., which closely resembles those long since described by G. Rose from Reichenstein in Silesia. The twinning-plane is, however, regarded by Mr. Brown not as R, but as $-\frac{5}{8}R$, as suggested by Naumann. The same writer[4] describes the occurrence and crystallography of the cassiterite from Irish creek, Rockbridge Co., Va.

Mr. Geo. F. Kunz[5] describes the native antimony and its associations at Prince William, York Co., New Brunswick. The antimony most commonly occurs in rounded or elongated masses having a compact, finely granular texture. More remarkable, however, are coarsely crystalline radiating masses consisting of blades four inches in length and one-eighth of an inch in width. Stibnite and kermesite are the only antimony minerals thus far observed associated with the native metal, although others doubtless occur.

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[1] Amer. Jour. of Science, July, 1885, p. 58.

[2] Ib., Aug., 1885, p. 108.

[3] Ib., Sept., 1885, p. 191.

[4] Amer. Chem. Jour., Vol. VI, No. 3.

[5] Amer. Jour. of Science, Oct., 1885, p. 275.